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भाग 3 छूटें

(पहला पुनरीक्षण)

Indian Standard

ISO MINIATURE SCREW THREADS

PART 3 TOLERANCES

(First Revision)

ICS 21.040.10

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

January 2005

Price Group 3

Engineering Standards Sectional Committee, MGP 20

FOREWORD

This Indian Standard (Part 3) (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Engineering Standards Sectional Committee had been approved by the Medical Instruments, General and Production Engineering Division Council.

This standard was first published in 1986 and was based on ISO/R 1501 : 1970 'Miniature screw threads' and DIN 14 - Part 3 : 1987 'ISO metric screw thread — Screw threads under 1 mm diameter — Part 3 : Tolerances'. ISO/R 1501 : 1970 has been withdrawn and DIN 14 - Part 3 has been revised in 1987. Therefore, this standard has been revised and aligned with DIN 14 - Part 3:1987 'ISO metric screw threads — Screw threads under 1 mm diameter — Part 3 : Tolerances', issued by the Deutsches Institut für Normung (DIN).

This standard is one of the series of Indian Standards on miniature screw threads and being published in four parts. The other three parts in the series are:

Part 1 Basic profile

Part 2 Basic dimensions for design profile

Part 4 Limits of sizes

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off the numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard
ISO MINIATURE SCREW THREADS
PART 3 TOLERANCES
(First Revision)

1 SCOPE

This standard (Part 3) specifies the tolerances for ISO miniature screw threads in the diameter range less than 1 mm.

2 TERMINOLOGY AND SYMBOLS

2.1 Terminology

For the purposes of this standard the following terminology and definitions shall apply.

2.1.1 *Nut Threads* — This shall mean to include internal threads.

2.1.2 *Bolt Threads* — This shall mean to include external threads.

2.1.3 *Crest Diameter* — Crest diameter shall mean, in case of nut threads, minor diameter and in case of bolt threads, major diameter.

2.1.4 *Root Diameter* — Root diameter shall mean, in case of nut threads, major diameter and in case of bolt threads, minor diameter.

2.2 Symbols

The symbols used in this standard are defined below:

Symbols	*Definition Tolerance*
T_{D_1}, T_{D_2}, T_d, T_{d_2}, T_{d_3}	Tolerances for D_1, D_2, d, d_2, d_3
EI	Lower deviation
es	Upper deviation
H_1	Depth of threads engagement

3 INDICATION OF TOLERANCE

The tolerance field indication consists of a number for tolerance grade and a letter for the tolerance position. Capital letter is used for nut threads and lower case letter for bolt threads.

4 TOLERANCE GRADES AND TOLERANCE ZONE POSITIONS

The tolerance grades and tolerance zone position for ISO miniature screw threads are given below:

Screw Thread	*Screw Thread Diameter*		*Tolerance Grade*	*Tolerance Zone Position*
Nut Threads	Minor diameter	D_1	5 and 6	H
	Pitch diameter	D_2	3	G
			4	H
Bolt Threads	Major diameter	d	3	h
	Pitch diameter	d_2	5	h
	Minor diameter	d_3	4	h[1]

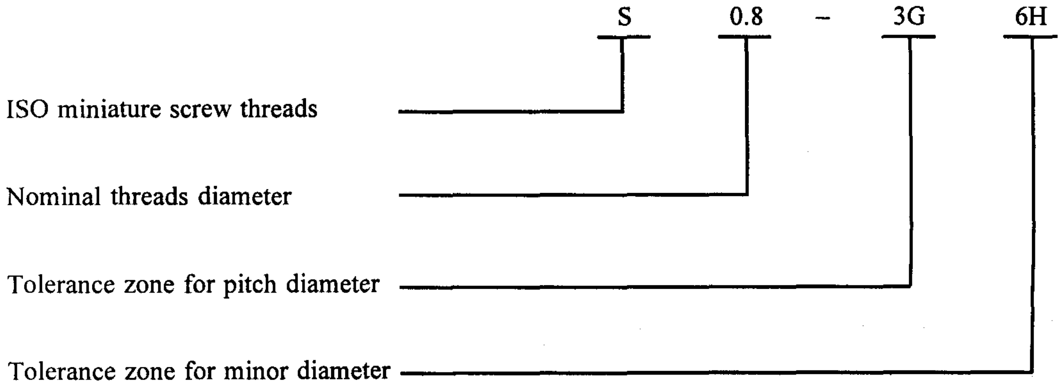
[1] The minor diameter of bolt threads is additionally listed. Hence all the three diameters have the tolerance zone 'h'.

5 DESIGNATION

The complete designation of the ISO miniature screw threads and its tolerance zone shall consist of letter *S* and the value of the nominal diameter, followed by a dash and the symbol for the screw threads tolerance.

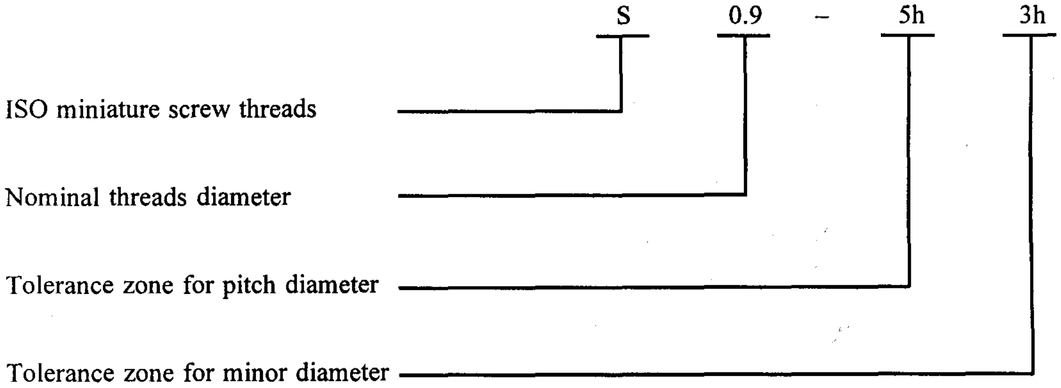
Example 1

Nut Threads Designation


S
0.8
–
3G
6H
ISO miniature screw threads
Nominal threads diameter
Tolerance zone for pitch diameter
Tolerance zone for minor diameter

Example 2

Bolt Threads Designation


S
0.9
–
5h
3h
ISO miniature screw threads
Nominal threads diameter
Tolerance zone for pitch diameter
Tolerance zone for minor diameter

6 TOLERANCES

6.1 Major Diameter

6.1.1 *Major Diameter of Nut Threads, D*

The major diameter of nut threads is not tolerated; however it is the minimum diameter.

6.1.2 *Major Diameter of Bolt Threads, d*

The tolerance on the major diameter of bolt threads shall be as given below:

Pitch, P mm	T_d (µm) *Tolerance Grade* 3
0.08	16
0.09	18
0.1	20
0.125	20
0.15	25
0.175	25
0.2	30
0.225	30

6.2 Pitch Diameter

For nut threads, D_2 and bolt threads, d_2.

Pitch *P* mm	T_{D_2} (µm) *Tolerance Grade*		T_{d_2} (µm) *Tolerance Grade*
	3[1]	4[2]	5
0.08	14	20	20
0.09	16	22	22
0.1	18	24	24
0.125	18	26	26
0.15	20	28	28
0.175	22	32	32
0.2	26	36	36
0.225	30	40	40

[1] Only for nut threads with tolerance position G.

[2] Only for nut threads with tolerance position H.

6.3 Minor Diameter

For nut threads, D_1 and bolt threads, d_3

Pitch *P* mm	T_{D_1} (µm) *Tolerance Grade*		T_{d_3} (µm) *Tolerance Grade*
	5	6	5
0.08	17	(23)	20
0.09	22	(34)	22
0.1	26	38	24
0.125	35	55	28
0.15	46	66	32
0.175	53	73	36
0.2	57	77	40
0.225	61	81	44

NOTE — Values within brackets shall be avoided as far as possible due to reduced pitch diameter over lapping.

7 TOLERANCE FIELD

The following position of tolerance fields are standardized as shown in Fig. 1, 2 and 3.

7.1 Nut Threads

7.1.1 *With Zero* (0) *Fundamental Deviation*

7.1.2 *With Positive Fundamental Deviation*

7.2 Bolt Threads

7.2.1 *With Zero* (0) *Fundamental Deviation*

8 FUNDAMENTAL DEVIATIONS

The fundamental deviations for nuts and bolt threads are given below:

Pitch P	*Nut Threads*		*Bolt Threads*
	Tolerance Position H	Tolerance Position G	Tolerance Position h1)
	D_1, D_2 and D_3	D_1 and D_2	d_1, d_2 and d_3
	EI	*EI*	*es*
mm	µm	µm	µm
0.08	0	+ 6	0
0.09	0	+ 6	0
0.1	0	+ 6	0
0.125	0	+ 8	0
0.15	0	+ 8	0
0.175	0	+ 10	0
0.2	0	+ 10	0
0.225	0	+ 10	0

1) In order that overlap of the pitch diameter shall not be reduced the nut minor diameter D_1 gets the tolerance position H, that means a lower deviation of zero.

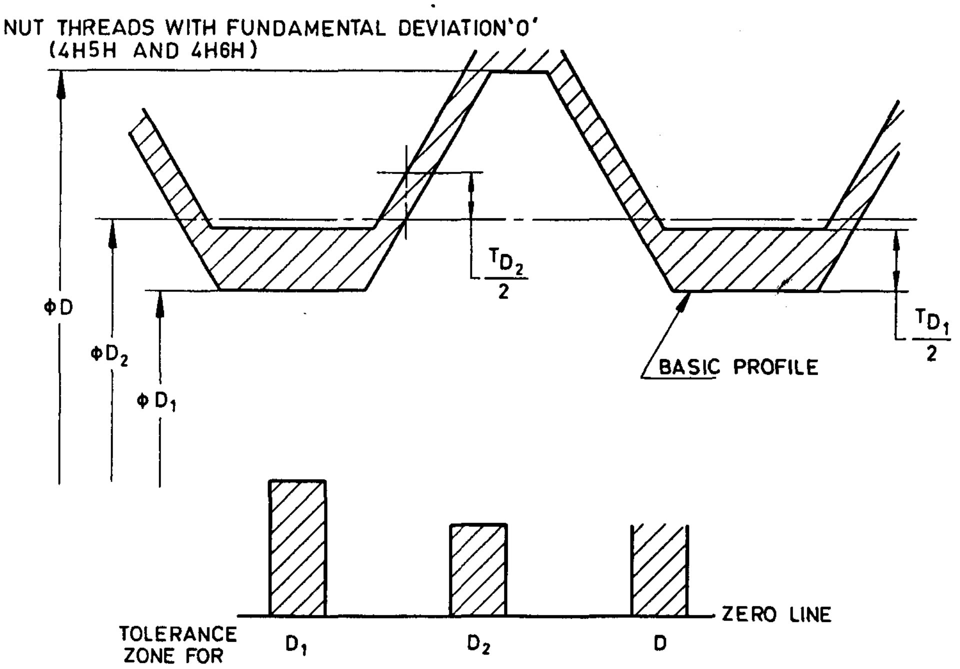


Fig. 1 Nut Threads with Zero Fundamental Deviation (Tolerance 4H5H and 4H6H)

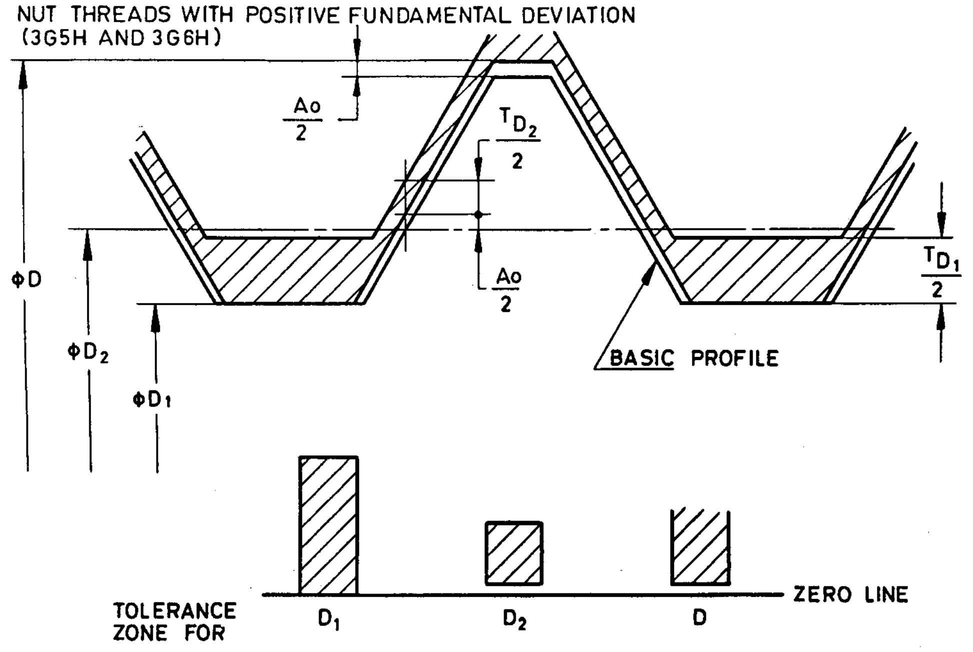


FIG. 2 NUT THREADS WITH POSITIVE FUNDAMENTAL DEVIATION (TOLERANCE 3G5H AND 3G6H)

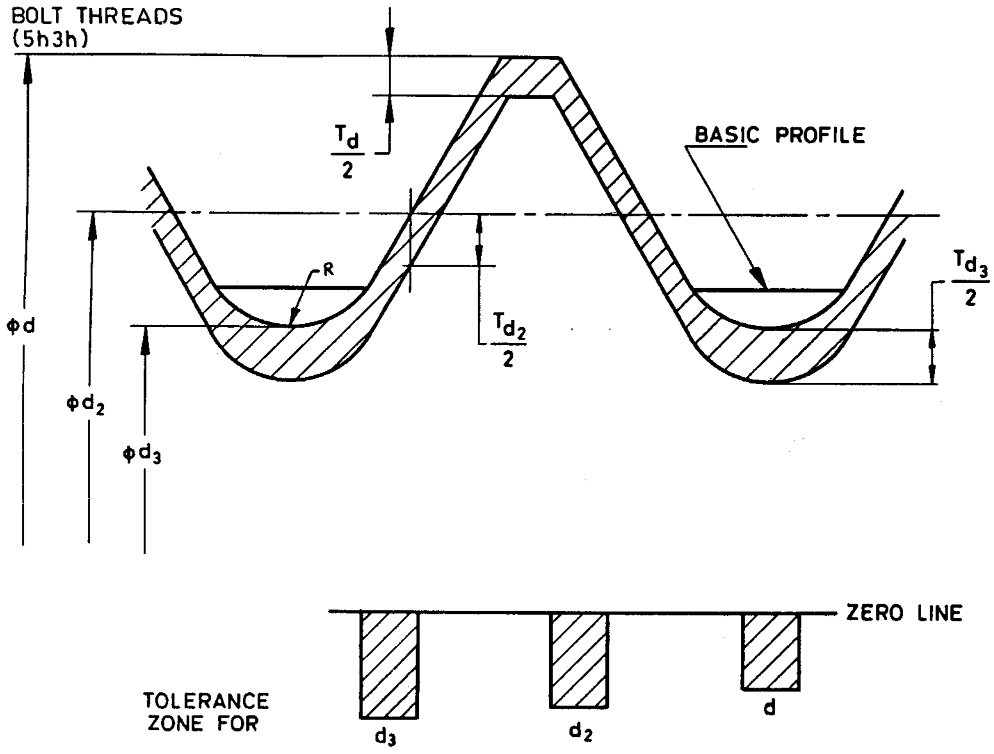


FIG. 3 BOLT THREADS WITH ZERO FUNDAMENTAL DEVIATION (TOLERANCE 5h3h)

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

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Amendments Issued Since Publication

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